UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 27611

PLYMOUTH AVENUE

OVER THE

MISSISSIPPI RIVER

DISTRICT 5 - HENNEPIN COUNTY, CITY OF MINNEAPOLIS

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 117)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge 27611, Piers 1 through 3, were in overall good condition with no defects of structural significance observed. A scour depression with two locations of footing exposure was observed at Pier 2. A scour depression was also observed at Pier 3, but with no footing exposure. A moderate accumulation of timber debris was observed along the east face of Pier 3. Aside from the scour, the channel bottom appeared stable and was comparable to what was last noted.

INSPECTION FINDINGS:

(A) A light accumulation of timber debris was observed along the east face of Pier 3 from the channel bottom up 3 feet. The debris consisted of a 2 foot diameter log and random 6 to 12 inch diameter timber drift.

(B) A scour depression was observed from the upstream nose to the downstream nose and all along the west face of Pier 2. The scour had a radius of 10 feet and a maximum depth of 3 feet. The scour had exposed the top of the pier footing at the upstream nose and for 30 feet along the west face of the pier, with no vertical face exposure.

(C) A scour depression with a 6 foot radius was observed at the upstream end of Pier 3 with a maximum depth of 1.5 feet. There was no related footing exposure.

RECOMMENDATIONS:

(A) Monitor the footing exposure and scour at Pier 2 and local scour at Pier 3, and if found to be increasing in the future, countermeasures may become warranted based on the findings of the scour analysis/rating done in 1996.

(B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 27611

Feature Crossed: Mississippi River

Feature Carried: Plymouth Avenue

Location: District 5 - Hennepin County

Bridge Description: The superstructure consists of five spans of two concrete box girders. The superstructure is supported by two reinforced concrete abutments and four reinforced concrete piers. The piers are numbered 1 through 4 starting from the west end of the bridge. The abutment and pier footings are supported by timber piles.

2. INSPECTION DATA

Professional Engineer/Team Leader: Daniel G. Stromberg, P.E., S.E.

Dive Team: John J. Loftus, Valerie Roustan

Date: August 30, 2007

Weather Conditions: Cloudy, 55°F

Underwater Visibility: 0.5 feet

Waterway Velocity: 1.0 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 through 3.

General Shape: The piers consist of oblong concrete rectangular shafts with rounded ends that are supported on rectangular footings founded on piles.

Maximum Water Depth at Substructure Inspected: Approximately 20.3 feet.

4. WATERLINE DATUM

Water Level Reference: Benchmark Elevation 804.7 at Pier 1.

Water Surface: The waterline was approximately 6.2 feet below reference.
Waterline Elevation = 798.5.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/08/07

Item 113: Scour Critical Bridges: Code N/96

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

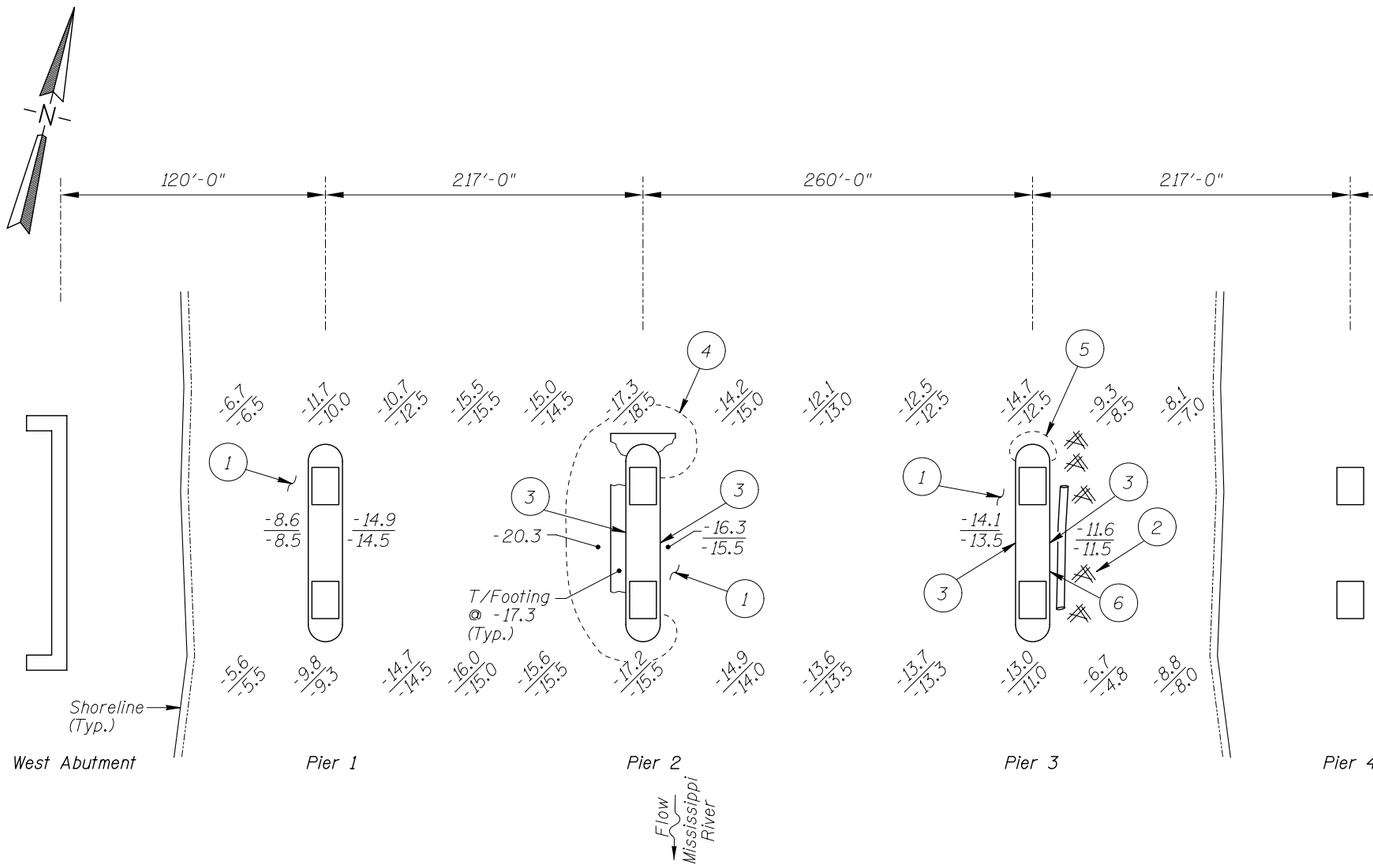
_____ Yes X No

Photograph 1. Overall View of the Structure, Looking North.

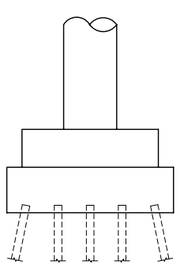
Photograph 2. View of Pier 1, Looking West.

Photograph 3. View of Pier 2, Looking West.

Photograph 4. View of Pier 3, Looking West.



SOUNDING PLAN



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

1. Piers 1 through 3 were inspected underwater.
2. At the time of inspection on August 30, 2007 the waterline was located approximately 6.2 feet below the Benchmark reference at Elevation 804.7 marked on Pier 1. Based on the reference this corresponds to a waterline elevation of 798.5.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units.

INSPECTION NOTES:

(1) The channel bottom material consisted of silty sand and gravel with up to 8 inches of probe rod penetration.

(2) A light accumulation of timber debris was observed along the east face of Pier 3 from channel bottom up 3 feet. The debris consisted of a 2 foot diameter log and random 6 to 12 inch diameter debris.

(3) A vertical hairline crack was observed from the top of the web wall to the waterline.

(4) A scour depression was observed from the upstream nose to the downstream nose and all along the west face of the pier. The scour had a radius of about 10 feet and a maximum depth of 3 feet. The scour had exposed the pier footing at the upstream nose and for 30 feet along the west face of the pier with no vertical face exposure.

(5) A scour depression with an 6 foot radius was observed with a maximum depth of 1.5 feet at the upstream nose of Pier 3.

(6) At 2 feet above waterline, at midpoint and both quarter points of east face of Pier 3 there is a 1 square foot area of section loss with 2 inches maximum penetration.

Legend

-2.0 / -5.2	Sounding Depth (8/30/07) / Sounding Depth (9/29/02)
	Scour Depression
	Timber Debris

Note:

All soundings based on 2007 waterline location.

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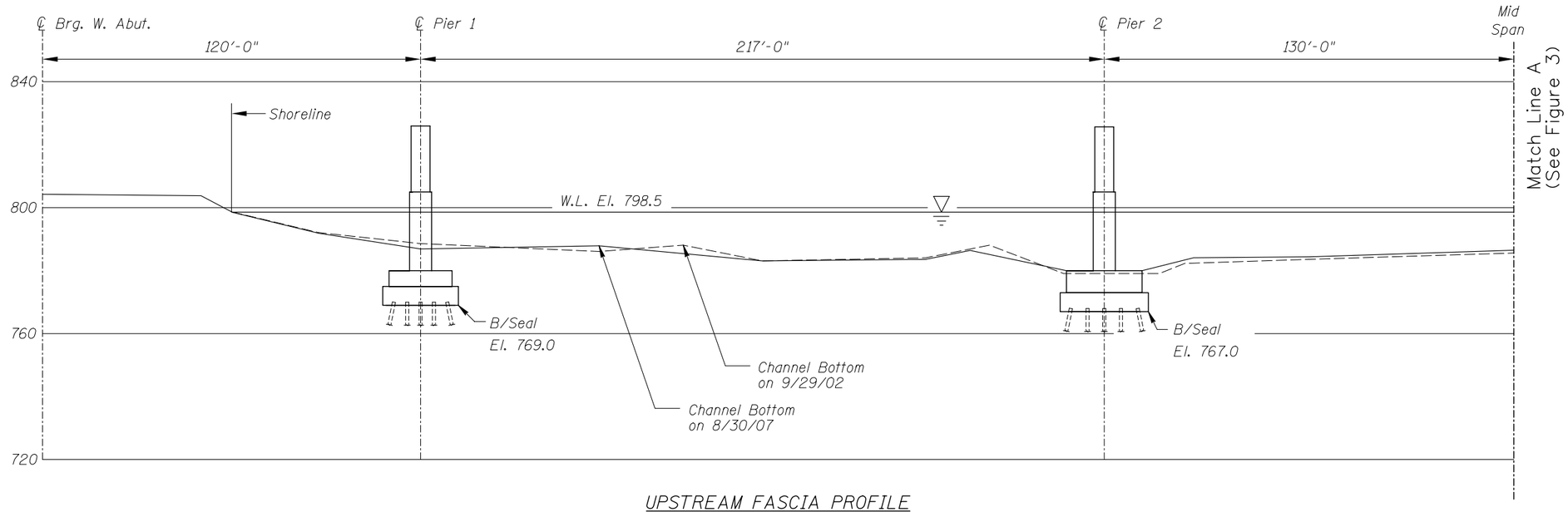
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

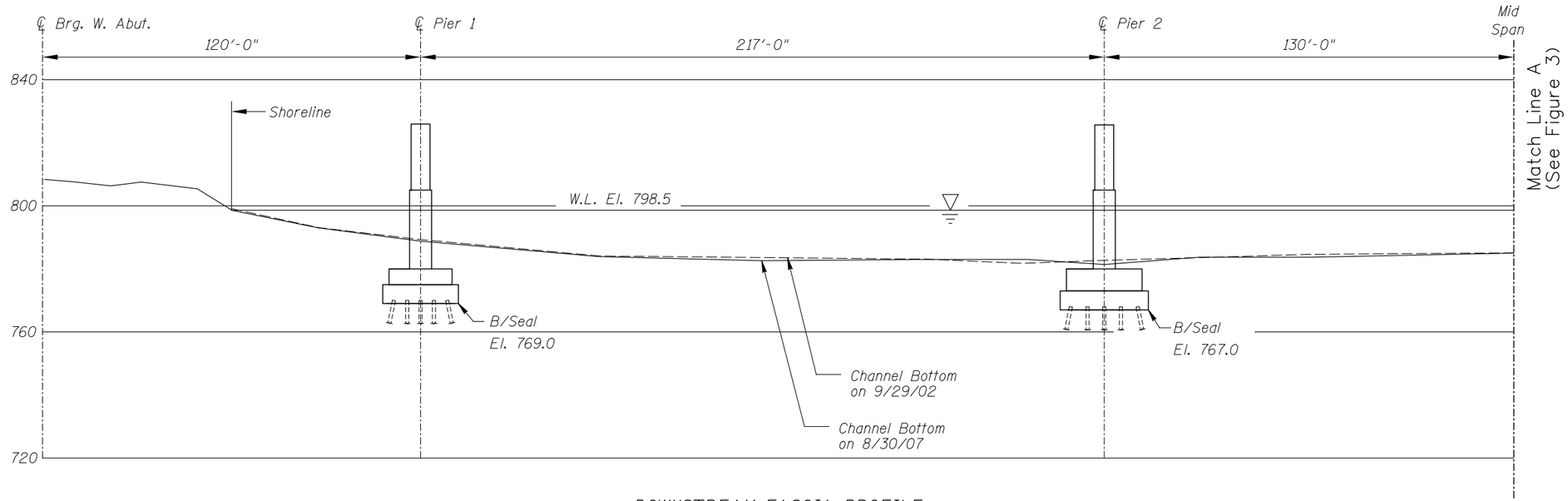
STRUCTURE NO. 27611
OVER THE MISSISSIPPI RIVER
DISTRICT 5, HENNEPIN COUNTY, CITY OF MINNEAPOLIS

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: AUGUST, 2007
Checked By: MDK		Scale: NTS
Code: 52210117		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

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UNDERWATER BRIDGE INSPECTION

STRUCTURE NO. 27611
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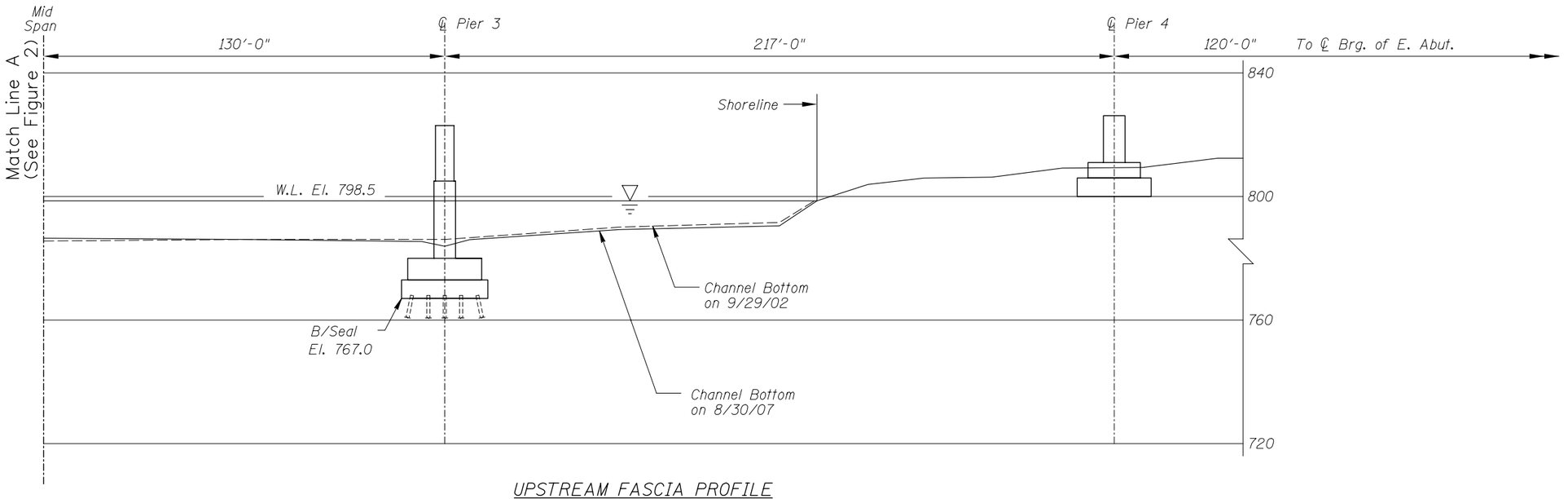
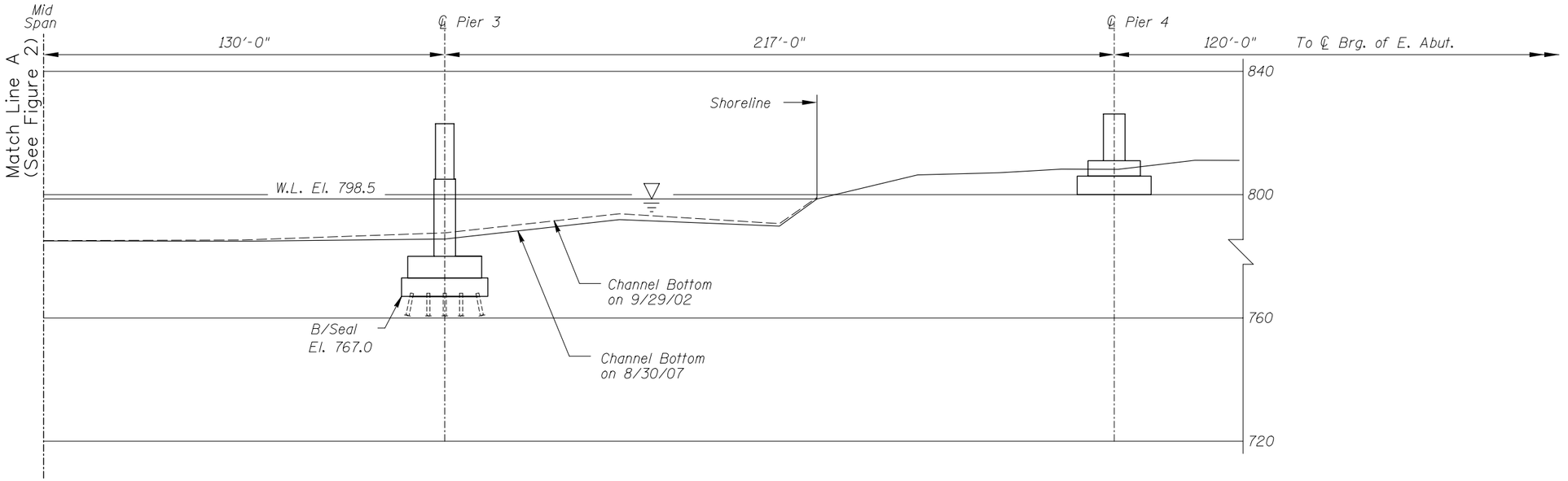
UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: AUGUST, 2007
Checked By: MDK		Scale: 1"=40'
Code: 52210117		Figure No.: 2



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

MINNESOTA
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UNDERWATER BRIDGE INSPECTION

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UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH		Date: AUGUST, 2007
Checked By: MDK		Scale: 1"=40'
Code: 52210117		Figure No.: 3

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: August 30, 2007

ON-SITE TEAM LEADER: Daniel G. Stromberg, P.E., S.E.

BRIDGE NO: 27611 WEATHER: Cloudy, 55°F

WATERWAY CROSSED: Mississippi River

DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR

_____ OTHER _____

PERSONNEL: John J. Loftus, Valerie Roustan

EQUIPMENT: Scuba, U/W Light, Scraper, Sounding Pole, Lead Line, Probe Rod, Boat, Camera

TIME IN WATER: 4:50 p.m.

TIME OUT OF WATER: 5:20 p.m.

WATERWAY DATA: VELOCITY 1.0 f.p.s.

VISIBILITY 0.5 feet

DEPTH 20.3 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 1 through 3

REMARKS: The concrete of the pier shafts was smooth and in sound and good condition with no notable defects. A scour depression with footing exposure (just top of footing) was observed at Pier 2 from the upstream to the downstream nose and all along the west face of the pier. A scour depression was also observed at the upstream end of Pier 3 with no footing exposure. A light accumulation of timber debris was observed along the east face of Pier 3. The debris consisted of a 2 foot diameter log and random 6 to 12 inch diameter timber drift, extending from the channel bottom up 3 feet.

FURTHER ACTION NEEDED: _____ YES X NO

Monitor the footing exposure and scour at Pier 2 and local scour at Pier 3, and if found to be increasing in the future, countermeasures may become warranted based on the findings of the scour analysis/rating done in 1996.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 27611
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Daniel G. Stromberg, P.E., S.E.
WATERWAY CROSSED Mississippi River

INSPECTION DATE August 30, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	14.9’	N	8	N	9	N	8	8	N	8	N	8	8	N	N	N	N	N
	Pier 2	20.3’	N	7	8	9	N	7	7	N	N	N	7	7	N	N	N	N	N
	Pier 3	14.7’	N	7	N	9	N	7	7	N	8	7	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: The concrete of the pier shafts was smooth and in sound and good condition with no notable defects. A scour depression with footing exposure (just top of footing) was observed at Pier 2 from the upstream to the downstream nose and all along the west face of the pier. A scour depression was also observed at the upstream end of Pier 3 with no footing exposure. A light accumulation of timber debris was observed along the east face of Pier 3. The debris consisted of a 2 foot diameter log and random 6 to 12 inch diameter timber drift, extending from the channel bottom up 3 feet.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.